WOODY ORNAMENTAL AND SHELTER PLANTS FOR THE NORTH CENTRAL REGION 1964-1968

Five-Year Report on Regional Plantings*
of
Prunus Davidiana (Carr.) Franch, P.I. 294614
David Peach

This species was introduced from China to western horticulture in 1865. This particular plant was a seedling with bright pink flowers selected at the North Platte Experiment Station, University of Nebraska, from seed of unknown parentage collected (in 1945) by Glenn Viehmeyer in an evaluation orchard at the U.S. Plant Introduction Station, Chico, California. The multi-stemmed parent, about 18 inches in diameter at one foot above the ground, the point of branching, was 19 feet high and 50 feet wide in 16 years. The trial plants were budded and grown at the North Platte Station. 90 plants were dug and shipped March 14, 1964 to the Regional Station for distribution to 30 North Central regional trial cooperators.

Description of the David Peach

Leaves: Deciduous, alternate, simple, narrowly ovatelanceolate 6-12 cm long, broadest near the base, long acuminate, broad cuneate, finely and sharply serrate, light green smooth, petiole glandular 1-2 cm long.

Flowers: Early, numerous, solitary, light bright pink 2.5 cm across on short stalks, calyx lobes oval and glabrous.

Fruit: Inedible, globose, 3 cm across, yellowish stone free, pitted and small.

Outstanding Qualities

This selection was recognized for its vigor, widespread crown, early flowers for planting on areas where space limitations are no problem.

Planting Site Data

Location of Trial Planting Sites

Twenty-nine plantings of Prunus Davidiana, PI 294614, are located in Figure 1 as well as the Palmer, Alaska planting not shown.

Soils

With the rapid reduction in living plants at the trial sites, it seems unlikely that a particular soil may have seriously affected the performance of any trial plants.

Exposure

A summary of the Report of Planting Forms, Item 66, returned to the Regional Station by cooperators shows that 16 trial sites for the David Peach, PI 294614, plants were essentially flat land, with less than 3% slope. Seven other trial sites were reported as having slopes greater than 3 percent. The trial site slope and direction of exposure data are given in the following summary.

Exposure of Regional Trial Planting Sites

	Slopes (0-3%)	Slopes (more than 3%)			
	Level	Direction			
		NE	SE	S	W
Number of Plantings	16	3	1	1	2

Competing Vegetative Cover

The report of planting, Item 73, indicates that trials of David Peach were made on fallow ground, nursery ground, or other cropland, as well as on land in perennial grass. Ground which had previously been tilled was bare or partly covered with annual weeds and relatively easy to prepare for planting of trial plants. Sites covered with perennial grasses were more difficult to prepare for planting of trial plants and required adequate plowing or scalping to destroy the grass plants.

On each annual report, Item 29, cooperators indicate the cultural treatments used to suppress herbaceous growth from competing for soil moisture and nutrients with the trial plants. A summary of the data on previous land use, vegetative cover and cultural practice with reference to trial plantings of this tree is included in Table 1.

Table 1. The number of David Peach, PI 294614, plantings by previous land use, vegetative cover and cultural practices to control herbaceous competition.

	Bare, Annual Weeds			Perennial Grass		
				Sod plowed	Sod scalped	
	Fallow	Crop land	Nursery			
				Fall	Spring	Spring
Number of Sites	11	3	3	1	1	5
Cultural Practices						
Clean tilled	10	3	3	1		
Clean tilled w/sod alleys	1					
Sod mowed, plants mulched					1	4
No treatment						1

* A regional testing program organized as a work plan under the North Central Regional Plant Introduction state-federal cooperative project NC-7 "New Plants"–The Introduction, Multiplication, Preservation, and Evaluation of New Plants for Industrial and Agricultural Utilization. Sub-Title of work plan: Woody Ornamental and Shelter plants for the North Central Region. This report concerns trial plantings of the Ornamentals Subcommittee in: Alaska, Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Ohio, South Dakota, and Wisconsin.

Table 2. A summary of David Peach trial planting sites with or lacking protection from nearby buildings and planted or native woods by cardinal direction.

Sites lacking protection	Direction	Sites Protected by Buildings		Trees
-	North	-		16-3 23-2
27-3	N. & E.	16-1		-
25-2	N. & W.	23-2		23-3 23-6
-	N. & S.	-		-
22-3 23-5 41-1	N. S. E.	-		23-4
49-1	N. S. W.	-		27-10 41-2
34-3	N. E. W.	-		34-1
34-1	South	25-2 27-3		16-1 34-3
23-2 23-3 23-6	S. & E.	-		-
-	S. & W.	-		-
16-3	S. E. W.	-		-
13-2 14-1 15-1 23-1 25-1	N. S. E. W.	27-7		16-2 27-7 34-2
-	East	23-4 27-10 41-2 49-1		25-2 49-1
-	E. & W.	-		-
16-1 23-4	West	-		22-3 23-5 27-3 41-1
	Total Locations		Duplicate Protection	
19	= 24	9	4	19
	Total Directions			
51	= 96	14	7	38
53%	Percent		47%	

Protection

Information on the protection which buildings and trees give to trial planting sites was obtained from Items 69-72 of the Report of Planting for David Peach prepared by cooperators and returned to the Regional Station. These data, together with complementary information (Items 67-68) relating to the lack of protection, are compiled in Table 2.

19 planting sites were found to be without protection from 51 cardinal directions or 53 percent of the total directions. Buildings at 9 trials and native or planted trees near 19 sites accounted for protection to 47 percent of the cardinal directions from the plantings.

Cooperators reported that 5 trials lacked protection from the winds in four directions; 6 trials were exposed in three directions each; 5 trial sites lacked protection in two directions each; while 3 were exposed in one direction each.

It was reported that 9 planting sites received protection from buildings in 14 directions.

Shelterbelts, windbreaks or native woods offered 19 trial plantings protection in 38 directions. Buildings and trees gave protection from the same directions in 7 instances on 4 sites.

Irrigation and Planting

A summary of the data submitted at Items 75-78 of the report of planting by cooperators at the time David Peach was planted in 1964.

Item	Treatment	No. of trial plantings
75-1	Irrigation prior to planting	1
2	No irrigation prior to plantings	16
76-1	Plants set with water in hole	12
2	Plants set without water in hole	10
77-1	Planting site irrigated immediately	2
2	Planting site not irrigated	13
78-1	Planting site can be irrigated	12
2	Planting site cannot be irrigated	11

Care of Plants in Trial

Cooperators reported various practices used in caring for their trial plants at Items 31-35 of the annual report form. A summary of the number of annual reports referring to a given treatment follows.

Item	Treatment	No. of annual reports	No. of locations	No. of trial sites reporting
31-1	Irrigation	7	4	
2	No irrigation	25	14	18
32-1	Fertilizer	4	2	
2	No fertilizer	29	15	17
33-1	Pruned	7	6	
2	Not pruned	25	14	20
34-1	Insecticide	2	1	
2	No insecticide	30	14	15
35-1	Fungicide	0	0	
2	No fungicide	32	16	16

Location of Plantings

The David Peach trial plantings were made at 29 locations shown in Figure 1, and near Palmer, Alaska (not shown).

Regional Trial Performance Data

Size of Trial Plants

Twenty-five cooperators measured the plants which they received and recorded this information as Item 62 on their report of planting forms. A summary of these reports gave two plants as topped at 6 inches above the root crown. The largest plants occurring at two trials were reported as 4 to 5 feet. These and other plant sizes are included in Figure 2.

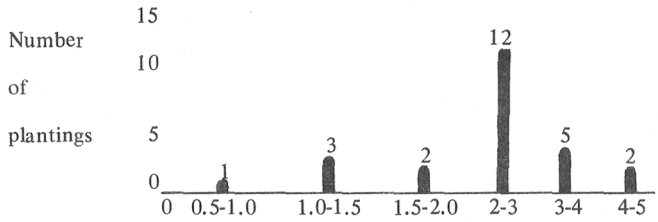

Figure 2. The size of David Peach planting stock summarized from cooperator's reports.

Survival

The information on survival is obtained at Item 55 on the annual Report Form, NC-7 RWPT2. Forty-seven annual report forms carried survival data which make up Table 3. Survival and Failure of David Peach Trial Plantings, 1964-68.

Available reports indicate 16 plants living on 8 trial sites. Since reports for 3 sites involving 6 plants have not been received since 1964 or 1965, viable information is limited to 10 plants at 5 planting sites. On a percent basis, known surviving plants regardless of the year reported are 19 percent of those planted.

Trial plantings with perfect survival are recorded for Lafayette, Indiana; Ames, Iowa; Garden City, Kansas; and Lincoln, Nebraska. The remaining 4 trials had one or two living plants.

The distribution of the trial plantings by survival percent at the end of the fifth year is shown in Figure 3.

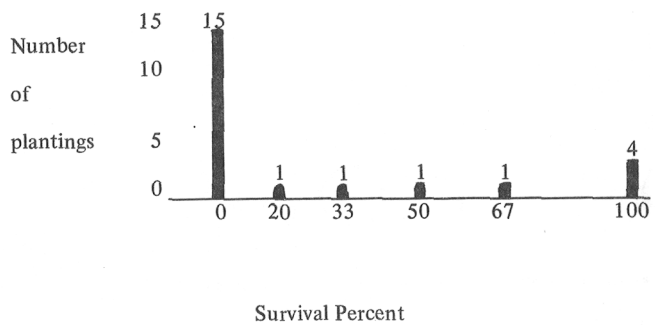

Figure 3. Trial David Peach plantings arranged by 5-year survival percent.

Table 3. Survival and failure of David Peach trial plants, 1964-1968. Source: Item 55, North Central Regional Trials of Woody Plants.

State		2	13	14	15	16	16	22	23	23	23	23	23
Location		2	2	1	1	2	3	3	1	2	3	4	6
No. planted		3	2	3	3	2	2	5	3	3	3	3	3
							Number of Live Plants						
Year 1964	1	(0)	----	----	3	(0)	2	(1)	----	3	(1)	3	(0)
1965	2	----	(1)	----	3	----	----	(0)	----	(0)	(0)	(1)	----
1966	3	----	----	3	3	----	----	----	(2)	----	----	(0)	----
1967	4	----	----	----	3	----	----	----	2	----	----	----	----
1968	5	----	----	----	3	----	----	----	2	----	----	----	----
Survival Percent		0	50	100	100	0	100	0	67	0	0	0	0

State		25	25	27	27	27	34	34	34	41	41	49
Location		1	2	7	8	10	1	2	3	1	2	2
No. planted		3	5	2	3	3	2	2	2	4	4	3
							Number of Live Plants					
Year 1964	1	(0)	(3)	----	----	3	(0)	(0)	(1)	----	----	3
1965	2	----	(2)	----	3	(2)	----	----	(0)	(0)*	(0)	(2)
1966	3	----	(1)	(0)	----	(0)	----	----	----	----	----	(1)
1967	4	----	1	----	----	----	----	----	----	----	----	1
1968	5	----	1	----	----	----	----	----	----	----	----	1
Survival Percent	0	20	0	100	0	0	0	0	0	0	0	33

States 12
Locations 23
No. planted 68

		Plants		Locations
		Live	Dead	
Year 1964	1	23	24	18
1965	2	16	20	2
1966	3	16	8	3
1967	4	16		0
1968	5	16		0
		16	52	23

KEY: ---- No annual report received
( ) Change in total plants on site
* Plants lost–a failure

Mortality

The mortality of trial plants reported for the year of planting totalled 24 plants at 10 sites. The second year reports indicated a loss of 20 more plants among 11 trials. This was followed in 1966 by 8 plants lost at 6 sites. The 15 trial failures accounted for 44 plants and occurred in this three year period. In the same period 4 trials lost 8 plants; nevertheless, in each of these plots 5 plants continued to live. No losses were noted during the fourth and fifth years. Thus losses amounted to 52 trial plants among 19 sites.

Initial Losses

All trial plants at Palmer, Alaska; Colby, Kansas; Duluth, Minnesota; Columbia, Missouri; Fargo and Dickinson, North Dakota were reported as having failed to establish following planting in the spring of 1964. Other losses reported for 1964 include 4 plants at Roselake, Michigan. Two plants at both Morris, Minnesota and Elsberry, Missouri were reported dead. At the Carrington, North Dakota site one plant failed to survive the first season. A total of 24 plants failed the first year.

Delayed Losses

Reports for the 1965 season included the loss of the entire plantings of 4 plants each at Brookings and Highmore, South Dakota, also of three plants at Waseca, Minnesota. The remaining plant at each the Roselake, Michigan; Morris, Minnesota; and Carrington, North Dakota sites was indicated as dead. Two plants were observed dead at Crookston, Minnesota. Losses of one plant each at Edwardsville, Illinois; Elsberry, Missouri; Scottsbluff, Nebraska and Madison, Wisconsin completed the 1965 report.

In 1966 a two plant loss at both Scottsbluff and Omaha, Nebraska, and the remaining plant at Crookston, Minnesota completed the record of these three sites. Reports from Exelsior, Minnesota; Elsberry, Missouri; and Madison, Wisconsin were for the failure of one plant at each location. Losses for the second and third years totaled 28 plants.

Growth Evaluation

First Year

The initial annual report on the David Peach trial plantings for the 1964 growing season prepared by 7 cooperators included data at Item No. 36, Transplantability. It was hoped that these data might give an indication of the plant's ability to recover from injury which might occur incidental to digging, storage, transportation and resetting at the new site. Three choices of growth or recovery are listed:

Poorly–little or no top growth

Slowly–most growth late in the season; possible immaturity and thus vulnerable to damage by adverse weather.

Readily–growth prompt and extensive

Seven cooperators returned ratings regarding transplantability. One planting of 4-5 foot trees was rated 'poorly'. Two plantings of 2-3 foot plants was considered as recovering 'slowly'. One planting consisting of 1.0-1.5 foot plants, one planting of 2-3 foot plants and 2 plantings of 3-4 foot plants were all rated as 'readily' growing after transplanting.

Table 3. The survival percent of certain David Peach trial plantings rated by cooperators as to first year growth and grouped by size of planting stock.

Size of planting stock	First Year Growth Ratings Trial size location & survival percent Poorly	Slowly	Readily
1.0-1.5			25-2 60
2.0-3.0		34-3 49-1 50.0 100-10"	27-10 100.0-12"
3.0-4.0			15-1 23-2 100 100.0
4.0-5.0	23-3 33.0		

Key: 22-3 State-Site
0.0 Percent survival
10" First year shoot growth

With half the rated plantings becoming total failures and only one fully successful planting, it is evident that this selection did not lend itself to this method of rating first year performance on trial sites.

Fifth Year Shoot Growth (inches):

Shoot growth is recorded as Item 72 of the annual report form. Because of the heavy loss of trial plants at many sites only four shoot growth reports were returned and Table 5 gives these measurements.

Table 5. Average fifth year shoot growth of the David Peach by location of trial planting.

Location	Average growth - inches
Excelsior, Minnesota	10
Lafayette, Indiana	14*
Madison, Wisconsin	18
Ames, Iowa	30

*Third year

Fifth Year Plant Size, Height-spread (feet)

The plants at Ames, Iowa after being reset at a new trial site in 1966 averages 6 feet in height by 3 feet spread at the end of 1968. These were the smallest plants reported. The largest plant measured and recorded at Madison, Wisconsin was 11 feet high and 9 feet spread. These and other David Peach measurements are reported in Item 63 and 66 of the Annual Report Forms make up Table 6 and appear in Figure 1.

Table 6. Average height spread of David Peach trial plants after five years on trial.

Location	Height (feet)	Spread
Ames, Iowa	6.0	3.0*
Elsberry, Missouri	7.0	8.0
Lafayette, Indiana	8.0	8.0**
Excelsior, Minnesota	9.7	7.0
Madison, Wisconsin	11.0	9.0

*Plants moved to new site in 1966
**Third year

Yearly Progress in Plant Height and Spread

The average yearly height and spread data from annual reports of four regional trial cooperators give a detailed picture of plant development at these locations.

The plants at Madison, Wisconsin were clean tilled with sod alleys between rows and irrigated the first three years. Here plants averaged two feet in yearly height-growth. These plants increased in spread from 2 feet at the end of 1964 to 9 feet when measured after the 1968 season. The number of living plants decreased from three to one by the end of the third year.

Two mulched plants in a sod area at Excelsior, Minnesota increased in height an average of 1.6 feet each year during the period between the third and fifth growing seasons. These plants received fertilizer for three years but no irrigation. Spread increased from 4 to 7 feet in this period.

Three plants at Ames, Iowa grew at a uniform rate of almost 1.5 feet per year. Plants here were in sod with mulch added. Except that these plants were moved in 1966, no other treatment was recorded. Spread gained from 2 feet in 1964 to 3 feet in 1968. At Elsberry, Missouri plants averaged 1.5 feet growth between 1964 and 1967. No height increase was recorded for 1968. Thus an average of 1.1 feet was obtained for the four years. Spread increased from 2.5 feet in 1965 to 8 feet in 1968.

Flowers and Fruit

The reports on flowers are limited to reports from the Elsberry, Missouri planting. Here one tree flowered annually starting with 1966. Flowers were recorded as few, showy and very early (March 3-10) at Elsberry. Fruits were not observed.

Planting Recommendations

PI 294614, Prunus davidiana, is not recommended for planting in the Region. There are too few existing plantings of this selection to warrant a statement on its plantings in the region.

Appropriate Uses

Until more is learned about the successful handling of this selection, suggested uses must of necessity be held in abeyance.

Further Testing

Tests to improve liveability are needed as a first step in any study of this selection.

Source of Plants

This clone is only available at a few Regional trial sites.

Reference

1. U.S. Department of Agriculture, Plant Inventory No. 172. Washington, D. C. 1968.

PALMER, ALASKA

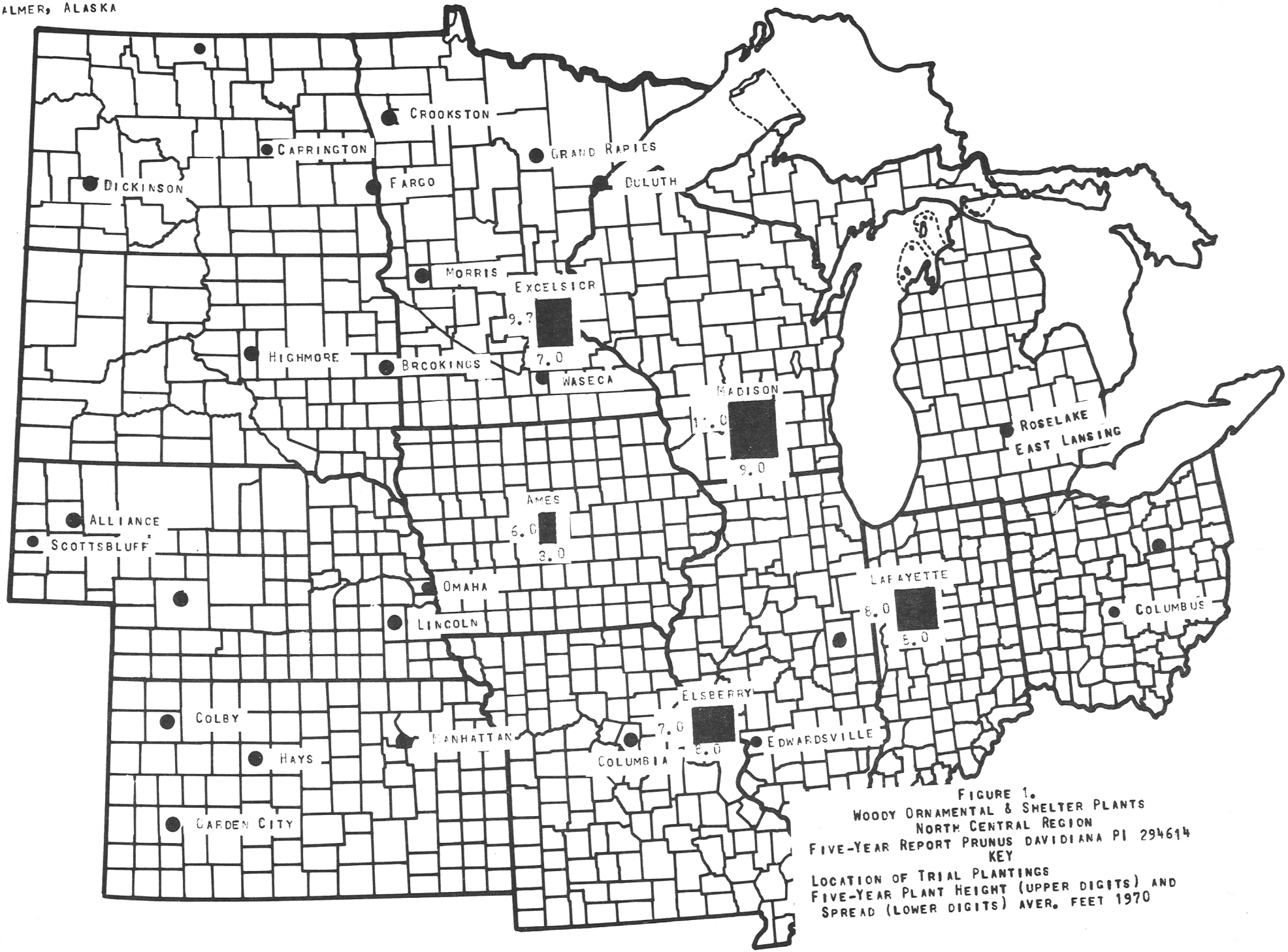

FIGURE 1.
WOODY ORNAMENTAL & SHELTER PLANTS
NORTH CENTRAL REGION
FIVE-YEAR REPORT PRUNUS DAVIDIANA PI 294614
KEY

LOCATION OF TRIAL PLANTINGS
FIVE-YEAR PLANT HEIGHT (UPPER DIGITS) AND
SPREAD (LOWER DIGITS) AVER. FEET 1970

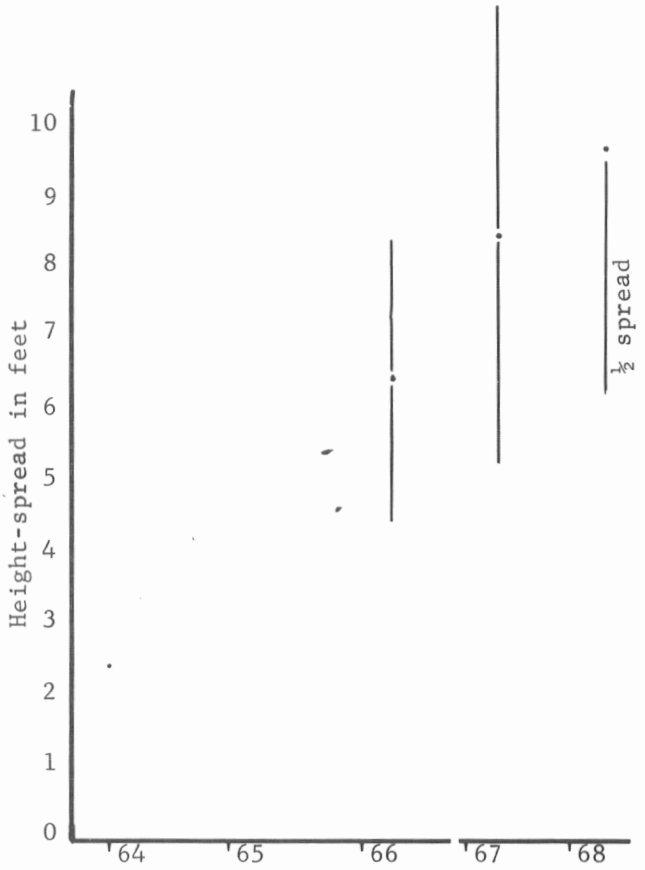

Fig. 5. Ave. height and spread of 2 trial plants at Excelsior, Minn. Sod scalped, plants mulched, sod mowed; fertilized, pruned, no irrigation.

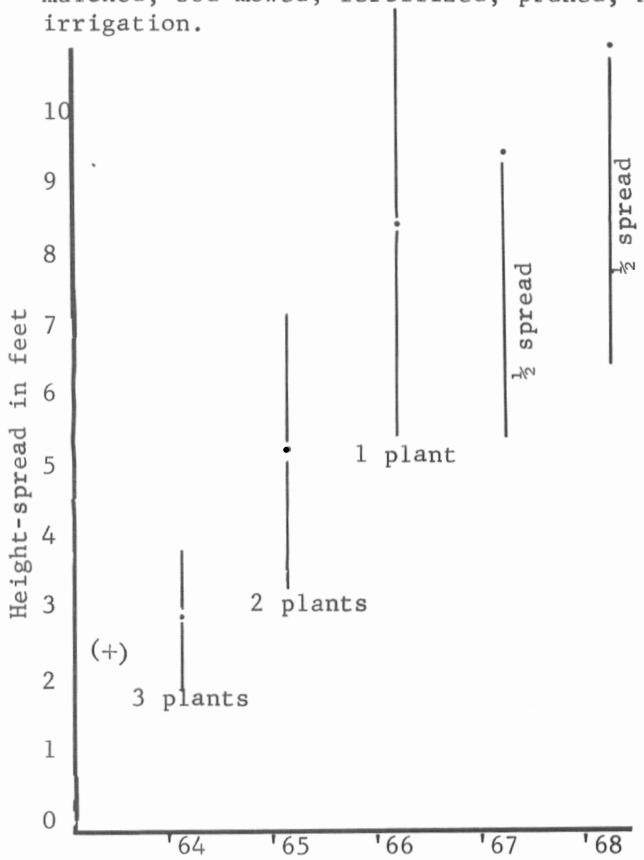

Fig. 4. Ave. height and spread of plants at Madison, Wis. Irrigated, clean tilled with sod alleys.

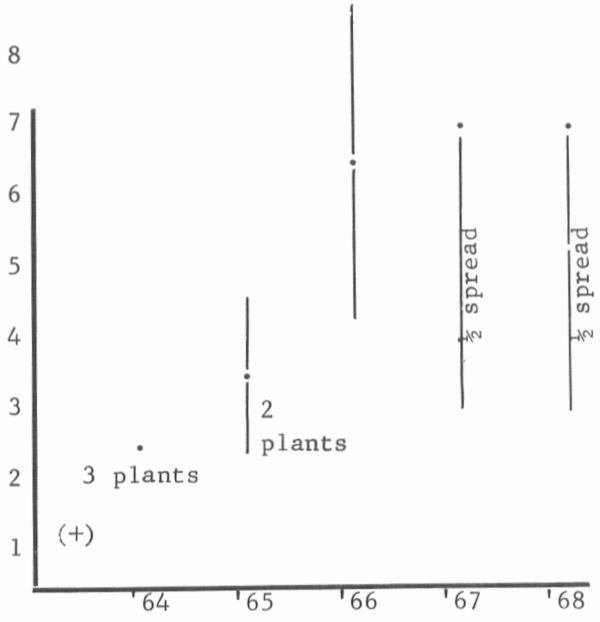

Fig. 7. Ave. height and spread of trial plants at Elsberry, Mo. Scalped sod mulched and mowed.

Figs. 4-7. North Central Regional trial of David Peach, PI 264614, (Measurements in feet).

(+) Size of planting stock.
. Height
— • — Spread.

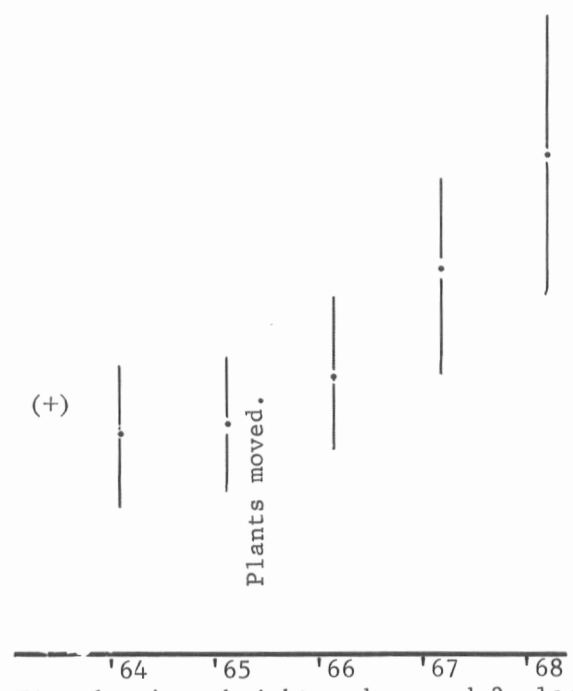

Fig. 6. Ave. height and spread 3 plants at Ames, Iowa. Tilled with sod alleys.